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AMSAT NEWS SERVICE
ANS-354

The AMSAT News Service bulletins are a free, weekly news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS publishes news related to Amateur Radio in Space including reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

The news feed on http://www.amsat.org publishes news of Amateur Radio in Space as soon as our volunteers can post it.

Please send any amateur satellite news or reports to:
ans-editor at amsat.org.

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ANS-354 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 354.01
>From AMSAT HQ KENSINGTON, MD.
December 20, 2015
To All RADIO AMATEURS
BID: $ANS-354.01

Special Membership Offer for Fox-1A launch expiring December 31

We've welcomed dozens of new members since the AO-85 launch with our offer of "Getting Started With The Amateur Satellites" as a free PDF with membership in AMSAT, but this offer will come to an end on December 31st, 2015. Point your browser to http://store.amsat.org/catalog/index.php?cPath=32 and help AMSAT keep amateur radio in space, and get a free e-book as a thank you.

>From http://www.amsat.org/?p=4591

AMSAT's Fox-1A is set to launch as part of the GRACE (Government

Rideshare Advanced Concepts Experiment) auxillary payload on the NROL-55 mission October 8, 2015 from Vandenburg AFB on an Atlas V vehicle. More details will be released when made available from our launch provider. NRO has released this factsheet about the mission: http://www.amsat.org/wordpress/wp-content/uploads/2015/10/GRACE_CubeSat_FactSheet.pdf

General information on Fox-1A is available in the downloadable AMSAT Fox Operating Guide http://www.amsat.org/wordpress/wp-content/uploads/2015/05/FoxOperatingGuide_May2015_Hi.pdf

(Editor's Note: The above two links were truncated to in order to fit required editorial format standards. Please copy and paste complete link, without spaces, into your browser of choice to view the information)

FoxTelem software for decoding and submitting telemetry has been made available for download at http://www.amsat.org/?page_id=4532

As part of the preparations for the launch and activation of this new satellite, AMSAT is making our "Getting Started With The Amateur Satellites" book available for a limited time as a download with any paid new or renewal membership purchased via the AMSAT Store. This offer is only available with purchases completed online, and for only a limited time. A perennial favorite, Getting Started is updated every year with the latest amateur satellite information, and is the premier primer of satellite operation. The 132 page book is presented in PDF format, in full color, and covers all aspects of making your first contacts on a ham radio satellite.

Please take advantage of this offer today by visiting the AMSAT store (http://store.amsat.org/catalog/) and selecting any membership option. While there, check out our other items, including the M2 LEOpack antenna system, AMSAT shirts, hats, and other swag. Thank you, and see you soon on Fox-1A!

[ANS thanks Drew KO4MA for the above information]

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17 US Schools Move Forward Into the Next Stage of ARISS Selection

Radio Amateur Satellite Corporation (AMSAT) and the

American Radio Relay League (ARRL), US managing partners of Amateur Radio on the International Space Station (ARISS), are pleased to announce the schools/organizations selections for the second half of 2016. A total of 17 of the submitted proposals during the recent proposal window have been accepted to move forward into the next stage of planning to host a scheduled amateur radio contact with crew on the ISS during the July through December period of 2016. This is a significant step in ARISS' continuing effort to engage young people in Science, Technology, Engineering, and Math (STEM) activities and raise their awareness of space exploration, space communications and related areas of study and career possibilities.

The ARISS program anticipates that NASA will be able to provide scheduling opportunities for these US host organizations during the July - December 2016 time period. These 17 schools/organizations must now complete an acceptable equipment plan that demonstrates their ability to execute the ham radio contact. Once theirequipment plan is approved by the ARISS technical team, the final selected

schools/organizations will be scheduled as their availability and flexibility match up with the scheduling opportunities offered by NASA.

The schools and organizations are:

Boca Raton Christian School Boca Raton, FL
The Children's Museum of Indianapolis Indianapolis, IN
Frontiers of Flight Museum's "Moon Day 2016" Dallas, TX
Howell L. Watkins Middle School Palm Beach Gardens, FL
iSPACE Cincinnati, OH
John Glenn Middle School Maplewood, MN
Kopernik Observatory &Science Center Vestal, NY
Lawrence Public Library Lawrence, KS
Museum of Innovation and Science Schenectady, NY
Northland Preparatory Academy Flagstaff, AZ
Peoria Riverfront Museum Peoria, IL
University of Nebraska's Peter Kiewit Institute Omaha, NE
South Street School Danbury, CT
Space Jam 10 Rantoul, IL
United Space School Seabrook, TX
U.S. Space & Rocket Center Huntsville, AL
World Genesis Foundation (WGF) Goodyear, AZ

Amateur Radio on the International Space Station (ARISS) is a cooperative venture of the Radio Amateur Satellite Corporation (AMSAT), the American Radio Relay League (ARRL) and the National Aeronautics and Space Administration (NASA) in the United States, and other international space agencies and international amateur radio organizations around the world. The primary purpose of ARISS is to organize scheduled contacts via amateur radio between crew members aboard the International Space Station (ISS) and classrooms or informal education venues. With the help of experienced amateur radio volunteers from amateur radio clubs and coordination from the ARISS team, the ISS crew members speak directly with large group audiences in a variety of public forums such as school assemblies, science centers and museums, Scout camporees, jamborees and space camps, where students, teachers, parents, and communities learn about space, space technologies and Amateur Radio. Find more information at www.ariss.org, www.amsat.org and www.arrl.org.

[ANS thanks ARISS, The ARRL and AMSAT for the above information]

ARISS Commemorative Event Update

ARISS is celebrating its 15th anniversary of continuous operations on the ISS. On November 13, 2000 the crew conducted their first ham radio contacts on ISS and then on December 21, 2000 ARISS conducted their first school contact with the Burbank School in Burbank, Illinois.

An SSTV commemoration of these historic events is in the planning for December 26 and 27. The transmission mode will be PD120 instead of the P180 mode used in the past. This will allow for more pictures to be transmitted per pass. ARISS is also investigating the possibility of a repeat of the event in January.

Pictures for transmission are currently under review and will be images that commemorate 15 years of school contacts using Amateur Radio on the International Space Station.

Please note that the event, and any ARISS event, is dependent on other activities, schedules and crew responsibilities on the ISS and are subject to change at any time.

While preparations are being finalized please check for new and the most current information on the AMSAT.org and ARISS.org web sites and the AMSAT-BB for the latest information on this event and others that ARISS plans to conduct over the next few months

[ANS thanks ARISS for the above information]

SA AMSAT Kletskous Cubesat Invites School Experiments to Fly to Space

SA AMSAT is inviting Southern African leaners and school science groups to take their next science project into space on the first amateur radio satellite being designed and built by radio amateurs in South Africa. Named Kletskous (Afrikaans for Chatterbox) the CubeSat will carry a linear transponder for communication between amateurs, school science projects and a telemetry system.

Kletskous measures 10x10x10 cm and will be powered by solar panels. Because of the small size, any science project to be considered for inclusion in the satellite has to be small and consume the minimum of power. The selected projects will be incorporated on one of the main printed circuit boards and connected to the telemetry system. This means that participants in the science projects will be able to download their own telemetry and evaluate how their project is performing and analysing the data collected inspace.

The telemetry stream will also be made available on the SA AMSAT web pages giving access to the data to learners on the tablets and laptops. The mission of the new satellite is to give radio amateurs and educational institutions in Southern Africa easy access to a Low Earth Orbit (LEO) satellite on as many of the available passes as possible and thus stimulate interest and activity in space, satellites and amateur radio. A secondary mission is to fly scientific payloads proposed and designed by learners or school science groups.

Kletskous will be using the two metre and 70 cm amateur bands. The uplink is on 70 cm, and the downlink on 2 m. A linear transponder with a bandwidth of 20 kHz is utilised for both FM and SSB. A sub-carrier for a telemetry downlink will be included. For command and control purposes a separate 70 cm frequency will be used. Currently frequencies in the 435.100 to 435.140 MHz range are considered for the uplink and 145.860 to 145.980 MHz for the downlink. The above architecture will ensure that the transponder is accessible for general use while the satellite is being commanded and controlled by the ground station.

School science payloads are being encouraged that measure things happening in space such the temperature inside or outside the satellite, sounds in space, radiation particle count and many more. Develop the project on a breadboard and test it on the bench, develop software for the project and then write up a proposal with as much information as possible. Include information about yourself or your group, include any photographs and contact details such as telephone number, email address, and physical location.

Email the proposal to saamsat(a)intekom.co.za

The closing date for proposal is 31 March 2016. Depending on the type and scope of the proposal, SA AMSAT will make the final decision and advise all entrants by 30 April 2016. Theentrants of the successful project or projects will be invited to make a short presentation at the 2016 SA AMSAT Space Symposium on 28 May 2016 planned to be held at the Innovation Hub in Pretoria.

The SA AMSAT CubeSat project is funded by donations. To contribute or participate in the project see the SA AMSAT web page at: http://www.amsatsa.org.za/

[ANS thanks SA AMSAT for the above information]

Slow Scan TV Image Sent Through AO-85

On December 13 Brazilian radio amateur Roland, PY4ZBZ, received an SSTV image sent in Robot 36 via AO-85.

AMSAT Vice President for Engineering Jerry Buxton, N0JY, said "I can tell you that in South America, they are having some fun, and that our analog-to-digital to analog IHU processing of the audio seems to work very well at SSTV frequencies!" Buxton told ARRL. "I don't know who uplinked the signal, but it was a ground-satellite-ground contact, nothing that originated on AO-85."

Buxton went on to state that the transmission was "a very good demonstration of the capability of the FM repeater on the Fox-1 series satellites."

The FM satellite uplink is at 435.170 MHz (67 Hz CTCSS tone required). The downlink is at 145.978 MHz. Both frequencies are subject to Doppler shift.

Whereas is it not recommended to use satellites to transmit SSTV images this personal experiment by South American hams didn't seem to interfere with any other transmissions. AMSAT VP of Operations Drew Glasbrenner KO4MA stated "At some point we will set up a period to try it over the US, but until then please refrain from repeating this experiment."

[ANS thanks AMSAT, Jerry, N0JY, and Drew KO4MA for the above information]

UT1FG/MM Itinerary During Trip Up the St. Lawrence River

Yuri, UT1FG/MM, is heading up to the St. Lawrence and Montreal and will visit two ports there. He has shared a list of grids that he will likely travel through. Some of these grids have not been previously activated, however, keep in mind that not every grid will be workable due to the timing of the available satellite passes. He may be in some of these grids for a very short time.

FL17 FL18 FL28 FL29

FM20 FM30 FM31 FM32 FM42 FM43 FM53
FM54 FM55 FM56 FM66 FM67 FM68 FM78 FM79 FM89

FN80 FN81 FN82 FN83 FN93 FN94 FN95

GN05 GN06 GN07

FN97 FN98 FN88 FN89 FN79 FN69 FN58 FN57 FN47 FN46 FN36 FN35

The ship is the Barnacle, a vessel on which he has previously sailed.

[ANS thanks John K8YSE for the above iformation]

Unscheduled Spacewalk Likely on Monday

Impacts that the amateur radio on the ISS will not return to service until after the EVA.

The International Space Station’s mission managers are preparing for a likely unplanned spacewalk by Astronauts Scott Kelly and Tim Kopra no earlier than Monday, Dec. 21.

Late Wednesday, the Mobile Transporter rail car on the station’s truss was being moved by robotic flight controllers at Mission Control, Houston, to a different worksite near the center of the truss for payload operations when it stopped moving. The cause of the stall is being evaluated, but experts believe it may be related to a stuck brake handle, said ISS Mission Integration and Operations Manager Kenny Todd. Flight controllers had planned to move the transporter away from the center of the truss to worksite 2. The cause of the stall that halted its movement just four inches (10 centimeters) away from where it began is still being evaluated. Progress 62 is scheduled to launch at 3:44 a.m. EST Monday, and dock on Wednesday to the Pirs docking compartment at 5:31 a.m. Wednesday.

The ISS Mission Management Team met Friday morning and is targeting Monday for the spacewalk, but will meet again in a readiness review Sunday morning. Managers could elect to press ahead for Monday, or take an extra day and conduct the spacewalk Tuesday.

ISS Expedition 46 Commander Scott Kelly and Flight Engineer Tim Kopra of NASA will conduct the spacewalk. It will be the 191st spacewalk in support of space station assembly and maintenance, the third in Kelly’s career and the second for Kopra. Kelly will be designated Extravehicular Activity crew member 1 (EV1) wearing the suit bearing the red stripes, and Kopra will be Extravehicular Activity crew member 2 (EV2) wearing the suit with no stripes.

A start time for the spacewalk either Monday or Tuesday has not yet been set, but NASA TV coverage will begin 90 minutes prior to the start of the spacewalk.

For amateur radio enthusiats should note that the EVA impacts the use of the amateur radio which will likely not return to service until after the EVA.

[ANS thanks blogs.nasa.gov for the above information]

SME-SAT video

The Surrey Space Centre in Guildford has released a 'Softstack' Integration time-lapse video of the SME-SAT CubeSat.

The mission objectives are:
A: Outreach – The satellite will provide beacons for which amateur satellite users and ham radio users will be able to receive.

B: Space qualification and performance characterisation of sensors.
• High performance COTS Gyroscopes (x3).
• High precision MEMS accelerometers.
• 2 Aperture Star Camera, At a later point in the mission these will be used in conjunction with the ADCS to characterise the closed loop performance of the sensors.

C: Performance characterisation of Nano-Control Moment Gyros (CMGs) for agility. The mission is equipped with 4-Nano-CMGs in a pyramid configuration for ADCS. This part of the mission will evaluate the performance of this system on the ADCS and agility of the satellite.

D: Space qualification and performance characterisation of the EPS The EPS for this mission has heritage from the Delfi-C3 and other missions and includes additional improvements to be demonstrated on this mission.

E: Smart Thermal Radiation Devices (STRD tiles) SME-SAT is equipped with a number of STRD tiles on the outside faces of the satellite for passive thermal management of the internal structure.

F: Flux Gate Magnetometer The mission contains a scientific grade miniaturized flux gate magnetometer that sits on the end of a deployable boom to improve the performance of the sensor. This payload will be switched into the ADCS for evaluation of performance during parts of the mission but is not the primary magnetometer for ADCS.

G: GPS SME-SAT also contains an experimental GPS system that will be switched into the ADCS loop at stages in the orbit to evaluate the performance of the system.

The IARU coordinated frequency for the satellite's 9k6 RC-BPSK AX.25 downlink is 437.150 MHz.

More information here
http://www.surrey.ac.uk/ssc/research/onboarddata/smesat/index.htm

[ANS thanks AMSAT-UK for the above information]

Look Up and Spot the Station! Learn More With STEM on Station

The International Space Station orbits 250 miles above Earth and travels about 17,500 miles per hour. The space station is visible in the night sky and looks like a fast-moving plane, but it is dozens of times higher than any airplane and travels thousands of miles an hour faster.

Learn more about how you can spot the space station and other ways

you can bring the station into your classroom by visiting NASA's STEM on Station website. While you are there, stop by and learn more about the yearlong mission and how it is helping us on our #JourneytoMars. Opportunities, resources and more await at this space-station-focused site!

To check out the website, visit http://www.nasa.gov/education/STEMstation.

[ANS thanks the NASA Education Express Message -- Dec. 17, 2015 for the above information]

NASA's Digital Learning Network Seeking Participants for International Event

In February 2016, NASA's Digital Learning Network is teaming up with The Royal Institution and Faraday Studios for a series of Google Hangout events in connection with British astronaut Tim Peake's mission to the International Space Station. The live hourlong events will include selected classrooms from the United Kingdom and the U.S. These classes will pose questions to Dr. Kevin Fong (author of "Extreme Medicine"), Dr. Steven Jacobs (Mr. Wizard) and NASA experts. The events will be broadcast live on YouTube.

The DLN currently is seeking U.S. middle and high schools (grades 5-12) that would be interested in participating in these events interactively with our U.K. partners.

Schools, if selected, would be required to conduct a test call in early January with a representative of the DLN to confirm participation. If you would like to have your school considered, please contact Caryn Long at caryn.long(a)nasa.gov. Inquiries must be received no later than Dec. 21, 2015.

For more information about the lecture series, visit http://www.nasa.gov/dln/opportunities/.

To learn more about NASA's Digital Learning Network, visit http://www.nasa.gov/dln.

[ANS thanks the NASA Education Express Message -- Dec. 17, 2015 for the above information]

Now Accepting Applications for NASA Summer Internships

Now is your chance to apply for exciting hands-on summer internship opportunities available at all NASA centers. High school, undergraduate and graduate students are needed to help NASA scientists and engineers with ongoing scientific and engineering research, technology development and spaceflight operations activities. Internship opportunities also exist in nontechnical areas such as communications, budget, procurement, education and human resources. NASA internships are stipend-paid and offer students mentor-directed, degree-related, real-time tasks. If you think you have what it takes to be part of NASA's Journey to Mars, please visit https://intern.nasa.gov today to apply or to learn more about the

numerous opportunities available to you.

The deadline for summer applications is March 1, 2016!

Please submit inquiries about the NASA Internships, Fellowships, and Scholarships One Stop Shopping Initiative, or NIFS OSSI, via https://intern.nasa.gov/oic/.

[ANS thanks the NASA Education Express Message -- Dec. 17, 2015 for the above information]

ARISS News

>From 2015-12-20 to 2016-01-04, there will be no US Operational Segment (USOS) hams on board ISS. So any schools contacts during this period will be conducted by the ARISS Russia team.

Look for SSTV image downlinks to commemorate ARISS' 15 years of school contacts on the ISS on December 26 and 27 (subject to change) See related story above.

An EVA that needs to be scheduled to fix a problem with the mobile transporter cart, will most likely mean that the the amateur radio on the ISS will remail off until after after the EVA.
http://tinyurl.com/ANS354-ISS-EVA

[ANS thanks ARISS, Charlie AJ9N and David AA4KN for the above information]

Satellite Shorts From All Over

+ Fox-1A Operating Guide - updated with post launch information. A Hi-resolution PDF for hard copy printing is available.
http://www.amsat.org/?page_id=2144

Hamfest brochure introducing AMSAT - trifold, print double-sided
http://tinyurl.com/ANS354-AMSAT-Trifold

[ANS thanks JoAnne K9JKM for the above information]

+ New ISS SSTV Video and "ISS SSTV Reception Hints" webpage

To help promote the tentative December 26th International Space Station Slow Scan TV event (and others that are planned over the next year) John Brier, KG4AKV, made a new video of an ISS SSTV reception that he filmed last April. He also made an extensive webpage with information, resources, and hints on receiving ISS SSTV events, including the upcoming ones.

Video: My First Perfect ISS SSTV Image!
https://www.youtube.com/watch?v=7to9uX1sWC4

Webpage: ISS SSTV Reception Hints
https://spacecomms.wordpress.com/iss-sstv-reception-hints/

+ NASA Commercial Crew Program 2016 Children's Artwork Calendar

Some of the best works of art come from children who are only limited by their imaginations, like the more than 150 young explorers from across the country who submitted artwork depicting human spaceflight as they see it. Sixteen masterpieces were chosen to be included in the NASA Commercial Crew Program 2016 Children's Artwork Calendar, which is now available for download in PDF format, at http://go.nasa.gov/1NVTww4. We offer a huge "thank you!" to all the explorers, ranging in age from four to 12, who submitted their work and hope that everyone will enjoy and use this calendar next year.

[ANS thanks the NASA Commercial Crew Program for the above information]

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

Primary and secondary school students are eligible for membership at one-half the standard yearly rate. Post-secondary school students enrolled in at least half time status shall be eligible for the student rate for a maximum of 6 post-secondary years in this status. Contact Martha at the AMSAT Office for additional student membership information.

73,
This week's ANS Editor,
EMike McCardel, KC8YLD
kc8yld at amsat dot org